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**Future System Operation**

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**System Governance – Electricity Systems Team**

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Dear Colleague,

**Energy Future System Operator Consultation**

Thank you for the opportunity to respond to the joint Ofgem and Business, Energy and Industrial Strategy (BEIS) consultation: "Energy Future System Operator". This response is made on behalf of Cadent and can be published by Ofgem and BEIS.

We support the broad aims of the consultation and specifically Option 1 which incorporates elements of the gas transmission strategic planning and forecasting function. We do not support Option 2 relating to inclusion of the gas daily operations team as it is integral to the safe and efficient operation of the National Transmission System which is even more important given the scale of change that we may see over coming decades.

We do have concerns in relation to including all the functions of the current ESO within the proposal for several reasons.

1. It is inconsistent with the intent of the proposal to provide technical and strategic planning advice to achieve net zero. We note the consultation asserts that there are synergies between the planning and balancing functions of the ESO and these are less apparent in gas, but if the role of the FSO is to provide technical and strategic planning advice, it is not obvious why managing a half-hourly balancing operational function is relevant to that purpose. If starting with a blank sheet for a whole-system technical and strategic planning organisation, would we really say it must have an operational balancing role to deliver strategic net zero objectives?

2. Having an FSO that is at its core the current ESO (including operational balancing) even with elements of Gas SO capability will culturally and technically view whole-system strategies primarily through an electrical transmission prism. This is a very real risk for the UK at a time when the most economical, least disruptive and sustainable pathways to net-zero are yet to be determined. This risk should not be underestimated and can be mitigated to a degree by placing duties on the FSO and more fundamentally ensuring its executive and non-executive leadership and succession reflects a real balance between gas and electricity backgrounds from its inception.
3. The challenges for gas are arguably more pressing than those for electricity and yet offer potentially far less costly and disruptive heat and transport options for UK consumers than alternatives. Those challenges include amongst other things, production of hydrogen at scale and fundamental changes to regulatory and commercial frameworks and physical system operation. Whether hydrogen or other green gas pathways are viable will emerge over the coming years, but the skills and knowledge to move them forward are not within the ESO. This will place more reliance on the gas networks, Shippers, Xoserve and the Joint Office to provide the expertise to drive the momentum needed.

We recognise this is the first round of what will be a significant level of engagement between BEIS, Ofgem and stakeholders and it is critical for the UK in meeting its net-zero targets and engaging consumers in that journey that we create an FSO that is capable of real whole-system thinking.

We trust the information provided in this response is useful and constructive and look forward to supporting BEIS and Ofgem as the FSO proposal develops.

Yours Sincerely,

Paul Rogers

*By email*

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## **Questions**

### **Chapter 2 – Case for Change**

#### **1. Do you agree that net zero will create the need for new technical roles in the electricity and gas systems, and require a new approach to energy system governance?**

Yes – The scale of the net zero challenge and pace of change required is such that a radical new approach within energy system governance is required sooner rather than later. The FSO model as described in the consultation could have a significant role building on its current technical expertise.

However, although BEIS recognises the need for a whole system approach optimising the use of gas and electricity options, at its core the FSO will largely comprise the ESO. The addition of NGG SO functions will provide an element of gas knowledge, but unless addressed at the start, the dominant culture in the organisation will be tilted towards electricity based pathways as this will be more familiar and natural territory for the leadership and majority of employees.

As part of the target operating model and to ensure implementation is fully aligned with delivering whole system pathways, it is vital that BEIS ensures the leadership, technical roles and culture of the FSO reflect the contributions that both (green) gas and electricity can make in achieving net zero. Beyond this, it will also need a good appreciation of how distribution networks can support the ambition and alongside recruiting some of those skills, work closely with energy networks to realise the full capabilities of the system.

#### **2. Do you agree that the establishment of a Future System Operator is needed to fulfil the kinds of technical roles needed to drive net zero?**

Yes – While BEIS and Ofgem have some technical knowledge, it is limited and largely restricted to supporting roles in delivering the overall UK economic and market development objectives of both organisations. Historically, both BEIS and Ofgem have relied on industry expertise and consultancy where significant technical/engineering problems need to be addressed and although this has worked effectively to date with incremental reform, the challenge is far greater looking forwards.

The FSO, if carefully constituted, could provide a centre of independent technical excellence that could support better and more effective decision making by Government and Ofgem in driving to net zero. We outline an alternative approach to achieve the aim in the answer to Question 4.

### **3. Do you agree that a Future System Operator should have roles in both the electricity and gas systems?**

Yes – Although developments in renewable gases (Bio-methane and Hydrogen) are in many respects behind those of renewable generation, their potential for addressing heat and transport demands with minimal disruption to customers and at lower cost than alternative electrical solutions should not be under-estimated. The majority of the UK's current housing stock will still be in use in 2050 and much of it will be difficult, costly and disruptive to retrofit with insulation and alternative non-gas heating appliances capable of keeping customers and the most vulnerable warm in cold winters.

If anything, therefore the need for an FSO that has as much gas capability as that of electricity is vitally important if the UK is to find affordable, sustainable, secure and diverse means to achieve net zero. For example, it would need to be involved in helping to define the strategy and planning of moving from a methane to a hydrogen-based market and the network transitions to enable this.

An FSO that has the capability to assess and weigh up the costs and benefits of alternative energy solutions for customers and different regions of the UK is of paramount importance. It can only do this if it has oversight and understanding of whole system solutions and whether they be electricity, gas, renewable heat networks or combinations that meet regional requirements and characteristics and work for the needs of customers.

### **4. Do you agree that a Future System Operator should be entirely separate from**

#### **National Grid plc?**

Yes – As BEIS has outlined in the consultation there is no suggestion or evidence that the current ESO has acted to discriminate operationally or financially in favour of National Grid. In the case of the GSO the opportunity is even more remote as NGG owns all GB transmission assets as distinct from the three TOs in electricity.

However, the role of the FSO will be quite different to that of the ESO and if heavily involved in overall system planning at gas and electricity transmission and distribution levels as well as potential offshore, Hydrogen and CCUS functions, the case for complete separation is axiomatic. It must therefore be fully independent of any commercial or other interests that could prevent it acting freely or expose it to challenge of unduly discriminating between parties or energy sources.

However, the case for including the current system and market balancing functions in FSO is much less compelling. While it may be expedient to formally separate the ESO from National Grid as it is already physically separated, the case for retaining those daily operations is weak when thinking about the role of the FSO in long term whole system planning and advice. Why would an organisation that is strategic in nature need to be involved in day to day system operation which may well divert management attention particularly when problems arise such as those in recent years.

Stepping back and thinking about the role of the FSO in supporting longer term planning and advice on the road to net zero, would not lead to a natural conclusion that it needs an electricity system operator function. Put another way, starting with a blank page probably wouldn't suggest acquiring and including an operational role in a strategic organisation.

BEIS should consider taking those elements of the ESO and GSO required for whole system strategic planning and advice to create the core FSO and the operational element of the ESO could then be separated into an independent entity.

**5. What issues are there with existing institutional arrangements in the UK energy system in relation to system-wide decision-making and planning?**

In general, the current system development frameworks have been effective to date, underpinned by duties and obligations arising in the Gas and Electricity Acts, respective licences and technical and safety legislation. However, despite some requirements to co-ordinate activities and recent developments associated with whole system engagement, system planning is largely based on individual network requirements with little inter-action to optimise between electricity and gas solutions.

In addition, the regulatory framework and price control arrangements don't lend themselves to system-wide planning, albeit some initiatives such as the Co-ordinated Adjustment Mechanism are nudging in that direction. The transmission, gas distribution and electricity distribution price controls are largely treated as separate programmes and in the case of electricity distribution follow 2 years after the others. Longer-term planning may also be partially constrained by a 5-year price control frequency which could limit the scale of ambition needed to invest early as decisions can be deferred until the next control. With support from the FSO, Ofgem could more explicitly examine and incorporate whole-system considerations into its price control planning and process to optimise net zero pathways.

More importantly however, from a net zero perspective, there is no central body with responsibility for looking over the price control horizon and across gas and electricity and thinking about what low regrets investments could be made from a whole system perspective. The FSO role could go a long way towards filling that gap. This is particularly important when developing hydrogen pathway roles and responsibilities and defining market models operating alongside or replacing those currently in place for methane.

**6. What examples/case studies are you aware of where net zero delivery in one part of the energy system did not adequately account for cross-system impacts or costs?**

It is difficult to point to individual examples, although renewable generation has placed more reliance on conventional generators such as gas fired stations to provide power when there's insufficient wind or sunshine for adequate supply. This in turn drives higher balancing and energy costs which are passed on to customers and a growing need for more smaller peaking power plants and associated investment in the gas system which is borne by gas customers. With the closure of nuclear plants over the coming decade, it's not obvious what else is being considered to support renewable intermittency other than more gas generation which could conceivably rise considerably higher than its 40% share of the market.

Not only does this have cost implications for customers, but also places a heavier burden on security of supply at peak. Further, while gas is the cleanest fossil fuel, we may well see emission gains elsewhere being offset by much higher demands for generation purposes. In these circumstances EVs and heat pumps are far from emissions free and may contribute to higher Carbon dioxide levels in the decades to come than might otherwise have been intended.

The FSO could mitigate some of these effects by looking across the electricity and gas systems and where alternatives such as hydrogen or battery storage are viable alternatives, examining a means to optimise the system accordingly.

## **7. Where should government focus in our efforts to improve systems thinking and coordination across the energy system?**

To date much of thinking and investment has been targeted at the some of the low hanging fruit or quicker wins for net zero. The UK has made tremendous strides in reducing its carbon emissions from 1990 levels largely through renewable and gas generation and technical improvements in heating (condensing boilers) and transport (more efficient combustion engines). This has largely been achieved without disrupting the lives of British citizens and at arguably relatively affordable levels.

Despite a growing uptake of EVs, the big challenges of heat and transport have yet to be addressed, and government is just beginning that journey. Although not talked about as much today, the energy trilemma remains highly relevant to the net zero debate. Government should therefore be focused very clearly on **affordability** for customers and particularly the most vulnerable in society. It's implicit that any pathways must be **sustainable**, both in the sense of achieving net zero and in longer term resilience. Throughout, we need to maintain **security of supply** and underpinning this must be diversity of supply. We therefore need to thoroughly understand the implications of complete reliance on electricity for power, heat and transport. Government should focus its efforts on encouraging a variety of different system pathways including those emerging such as hydrogen (such as described in the recently published Hydrogen strategy) to make it much easier for customers to make net zero choices that suit their lifestyles and budgets. The use of clear Strategy and Policy statements from government should assist Ofgem in formulating price controls with more confidence to provide secure funding for networks to implement programmes consistent with a clearer strategic context.

## **Chapter 3**

### **8. Do you agree that the FSO should undertake all the existing roles and functions of NGESO? If not, please explain why.**

No – For the reasons outlined in answer to Question 4, it's not obvious other than expediency why the FSO as an adviser on whole system planning would need to incorporate the daily ESO balancing and market activities. Although having access to a larger body of resources and data would undoubtedly be useful, it could just as easily obtain what it needs from any of the operational businesses. Moreover, to the extent that it must ensure it delivers its obligations in respect of system operation and balancing, a good deal of leadership focus will be on this activity as much as system planning for gas and electricity.

As stated in the answer to Question 4, starting with a blank page and thinking about the purpose of the FSO would not draw the conclusion that a daily electricity market system operation function would need to be added to a new whole system (including gas) strategic organisation.

### **9. Do you agree there is a case for the FSO to undertake the gas strategic functions outlined in Option 1? Please elaborate and provide any views on the functions we have**

**outlined.**

Yes – This is vitally important to ensure that the FSO is capable of assessing whole system development and investment. However, the balance between ESO and GSO capability should be a prime focus for BEIS to avoid the risk that the FSO will approach its duties primarily or coloured by a predominance of electricity transmission viewpoints. Indeed, the gas challenge arising through developing entirely new Hydrogen frameworks, contracts and re-configuration of systems is arguably one that would require more gas skills and knowledge than that required for electricity, where the change will be less radical.

It would also help diversify the FSO through taking on electricity and gas distribution skills as well as working closely with distribution as well as transmission owners.

We note that Option 1 may well lead to some duplication and therefore additional cost in certain planning activities between the Gas Transmission Asset owner and the FSO, but this in itself might stimulate useful outcomes in future investment scenarios.

**10. Do you agree that there is not currently a case for the FSO to undertake all GSO roles and functions, including real-time gas system operation, as outlined in Option 2? If you do not agree, please explain why.**

We agree that at least for the time-being Option 1 is the most pragmatic approach, particularly as the within day balancing activity of the GSO is more highly integrated with the GT Asset function and integral to NGG's Safety Case. Unlike the ESO, it's not obvious that there could be a significant perception that NGG could provide any undue preference as there are no other national gas transmission owners.

**11. Do you have views on the proposal for an advisory role? What organisations do you consider would benefit from the provision of advice by the FSO? Who should bear the costs of providing that advice?**

Beyond government, Ofgem, HSE and related organisations there are a range of stakeholders who could benefit from FSO advice, including Regional development groups, Local Authorities and research institutions. At this stage it is rather difficult to be specific, but generally, those parties seeking such advice beyond government, local government, regulators and associated agencies should bear the costs to provide the right service incentives.

**12. Do you have any views on the other areas where we are considering new and enhanced roles and functions for the FSO (outlined in section 3.2)?**

Our primary observation on the number of potential roles for the FSO is that it is a very wide-ranging list and this raises a question as to whether BEIS needs to step back and consider what is the key purpose of the FSO. This should define more clearly what is and isn't in scope and where duties should sit.

We welcome the role that the FSO could have in shaping heat, hydrogen and CCUS as well as transportation charging methodologies, but these are all emerging and complex issues that can only be achieved by working with the transmission and distribution networks where much of the capability and knowledge rests. We do not agree that the FSO would be well placed to advise on gas

distribution issues, as the consultation makes clear that the organisation will be comprised the ESO and an element of the GSO function, neither of which have any gas or electricity distribution background or depth of understanding. This reinforces the need for the FSO to work very closely with distribution networks to achieve sustainable whole system outcomes that facilitate net zero at the lowest cost and disruption to customers.

#### **Chapter 4**

### **13. What are your views on our proposed characteristics and attributes of a future system operator and how the models presented would deliver against them?**

The proposed characteristics and attributes of the FSO are aligned with the intent of the model as described in the consultation. There are however, some inconsistencies in the proposal which seeks to maintain costs broadly in line with those currently in place, yet recruit highly skilled employees to fulfil a wider remit and the inevitable duplication of functions between the FSO and networks. For example, the consultation already acknowledges there will be a need for planning functions in both NGG and the FSO. If the FSO is expected to advise on distribution network activity as well, then it may need to recruit the workforce to support that ambition.

The aspirations presented in the consultation suggest a significantly larger cost base overall and this should be acknowledged. This may be offset by efficiency gains that would otherwise not be achievable if the proposal was not implemented.

### **14. Are there other characteristics or attributes that we have not yet considered?**

If a whole system approach is to underpin the FSO role, it must have a real balance between gas and electricity expertise. Although the consultation rightly acknowledges the need to maintain a whole system approach, the core of the FSO will remain the ESO and this will perpetuate the historic focus of energy policy development being viewed through an electricity lens unless it is addressed as a clear requirement. The government hydrogen strategy outlines the potential and ambition for Hydrogen across, heat and transport and the FSO should have a mindset that reflects and supports that ambition.

As stated elsewhere in this response, the challenges for gas are arguably far more immediate than those of electricity and this should drive the need for more gas expertise in the FSO than likely under either of the two proposed options. Hydrogen is possibly the only credible substitute for methane to provide sufficient peak heat capability for customers in a seasonal normal winter and climate change is driving more extreme weather events such as the Beast from the East in 2017. The development of a new Hydrogen regulatory, commercial and physical framework will need to draw on more gas resource than an ESO heavy FSO could muster. Equally, if gas networks were to be phased out, then the challenges of doing so safely and sustainably would require an FSO with the relevant skills which the proposed model does not possess.

### **15. Are we considering the right organisation models for the FSO? And why?**

As referenced above there is a pressing need to ensure the FSO organisation has the culture and capability to advise and plan on a whole system basis. Beyond that, there is a question as to whether an organisation that at its core is providing long-term and strategic planning and advice really needs to operate the electricity system market. As outlined earlier in our response, the perceptions around the ESO in relation to the electricity market stem from there being three transmission network owners, something which isn't the case in gas. The consultation proposal may



therefore be conflating two separate issues and conflating them in the proposed solution when they are entirely different problems. An alternative solution would be to separate the ESO balancing and market operations from NGET to address the perceptions about its place and actions in the market and separately to take the strategic planning and advisory roles of both the ESO and GSO into what would become the FSO. This would allow the FSO to carry out its primary net zero whole system tasks unencumbered/distracted by operating the daily electricity market system operator function.

This approach is far better aligned with the stated aims of the consultation than the approach currently described in options 1 and 2.

As to whether the organisation should be public or privately owned, there are no obvious reasons that favour one over the other, but the function of the FSO might point more towards a not for profit or public body as the levels of return and risk may make it unattractive to private equity.

**16. Are we considering the right elements for the FSO's regulatory and accountability frameworks? And why?**

The frameworks as described are consistent with the positioning and potential roles of the FSO.

**17. Do you have views on the level of shareholding or control involving other 'energy interests' and the FSO at which a conflict of interest would become a concern?**

We agree, that to ensure that perceived or actual conflicts of interests do not arise that a shareholding or other energy interest should be precluded.

**18. Are we considering the right implications of our proposals for Elexon and Xoserve?**

It's right to consider the implications for Elexon (more so due to ownership) and Xoserve, although in the latter case, the current shareholding interest would more logically remain with NGG as it does now. We also note that the role of Xoserve is being considered within the code governance review and this may have more of bearing on its future and relationship with gas transporters than this FSO proposal.

**Chapter 5**

**19. What is your view on the preferred implementation approach? Please explain why.**

The phased implementation approach is logical for the model as proposed, although we note the plan is conceptual, rather than providing firm dates at this point.

**20. Based on the areas where we are considering new and enhanced roles and functions for the FSO, which of these should be prioritised for development? Please explain why.**

As outlined previously, as the core of the FSO as proposed will be the ESO function, there is a need to prioritise gas skills and ensure this is reflected in the leadership and board of the FSO. This is required to ensure that a whole system mindset is embedded within the new organisation at all levels from inception.

**21. What do you believe are the risks to implementation? How can these be mitigated?**

There are a significant number of risks associated with any change of this scale, but three primary risks are worth drawing out.

The first is loss of skilled resources as separation from National Grid may cause some employees to leave, creating gaps that are difficult to replace. Networks are now more efficient than they have ever been, but that means the depth that meant losses could be absorbed is no longer available to the same extent. This could be mitigated by ensuring employees are supported and informed throughout the process and succession and resourcing plans are adequate for both the FSO and those networks such as NGG providing staff and having to backfill.

The second is that scope and roles are not clearly defined between the FSO, Ofgem, BEIS and other industry parties such that the potential value that an FSO can bring is not realised. This is partially exemplified in this consultation by the range of possible functions that FSO could carry out and the need to be very clear at the outset what its purpose is and ensure it is focused on core tasks.

Finally, that it fails to provide good whole system analysis, planning and advice because the organisation is tilted towards electricity-based scenarios and unable to adequately address potential electricity and gas distribution net zero options. This can be mitigated through a combination of organisational design and close engagement with energy networks where much of the capability resides. More fundamentally, if the system operation element of the ESO was separated from the FSO then it is more likely that a balanced structure that can facilitate delivery of the UK net zero ambition can be achieved.

**22. Do you have any comments on potential implications of implementation for you, your organisation, or other stakeholders?**

For the FSO to be successful it must work closely with government, regional development agencies, Ofgem and transmission and distribution network operators to support the deployment of whole system solutions that engage and encourage customer acceptance. Many of the current net zero initiatives are being driven by networks, whether Hydrogen such as, Hynet, H21 and Hydeploy or electricity centred, like EV, heat pump and flexibility products. If the UK is to meet its net zero targets, the FSO must work closely with those who can support and deliver the solutions needed across the entire value chain and energy networks are key to our collective success.

**Chapter 6**

We do not feel informed enough to comment on those questions raised in Chapter 6 at this stage. The IA is underpinned by assumptions which are untested and as such could change significantly as proposals are developed and scenarios change over time.

**22. What is your view on the position there are likely to be cost savings across the energy system from an increased “whole system” view, as described in paragraphs 47-52 of the IA? If so, is the potential magnitude of savings**

illustrated fairly in the IA? If not, why not?

23. What is your view on the conclusion that policy intervention is likely to increase the benefits of onshore electricity network competition, as described in paragraphs 53-59 of the IA? If you agree, is the potential magnitude of savings illustrated fairly in the IA? If not, why not?

24. Do you think that the impact assessment has identified and considered the key costs and benefits of policy intervention? If not, can you provide details on other impacts that have not been considered?

25. Do you think that the distribution of impacts is fairly represented, with impacted groups correctly identified? Outlined in table 5 of the IA.

26. We invite respondents' views on whether the proposals for energy system governance reform may have a different impact on people who have a protected characteristic (age, disability, gender re-assignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex or sexual orientation), in different ways from people who don't have that characteristic.